

MIXED-MODE CRACK PROPAGATION IN FUNCTIONALLY GRADED MATERIALS

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Two-dimensional mixed-mode crack propagation in functionally graded materials is simulated by means of finite element automatic remeshing scheme. This simulation is performed in I-FRANC2D (Illinois-Fracture Analysis Code 2D) where several finite element models for functionally graded materials have been implemented. Crack growth and its direction are determined by fracture and direction criteria, which incorporate fracture parameters such as stress intensity factors and T-stress. In this work, these fracture parameters are calculated by means of a unified approach, which uses the interaction integral method. Crack trajectories obtained by the present simulations are compared with available experimental counterparts. In addition, the effect of T-stress on crack growth direction is also investigated. In fact, the consideration of T-stress in fracture of FGMs is a key aspect of the present work.